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REMARKS/ARGUMENTS

In the March 8, 2007 Office Action, the Examiner rejected claims 1-33 pending in the application. This response cancels claim 9, without prejudice or disclaimer, and amends claim 1 for consideration. After entry of the foregoing amendments, claims 1-8 and 10-33 (6 independent claims; 32 total claims) remain pending in the application. Reconsideration is respectfully requested.

Claims 1-9, 26-29, 32 and 33 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Breivogel et al., U.S. Patent No. 5,554,064 (hereafter "Breivogel") in view of Towery et al., U.S. Patent No. 6,270,395 (hereafter "Towery"). In particular, the Examiner states that Breivogel teaches a platen, 620, comprising a channel, 628, to allow polishing solution to circulate, for polishing a surface of a workpiece, the platen configured to orbit about an axis at a speed up to about 1,000 or 2,000 RPM, a polishing surface, 602, and to dither, attached to the platen and a workpiece carrier, 310, proximate the polishing surface. The Examiner further states that Breivogel teaches all of the limitations of the claims except for the workpiece including a low dielectric material, the carrier and the platen being configured to move the workpiece relative to the polishing surface at a speed of about 0.8 to 3.2 m/s., the carrier configured to apply about 0.2 to about 2 pounds per square inch pressure to the workpiece, and the platen being configured to allow the polishing slurry to flow at a rate of about 120 to 200 ml/m. The Examiner then contends that Towery teaches chemical mechanical polishing of a low k dielectric material with a platen configured to orbit and polishing with a surface speed of about 0.8 to 3.2 m/s. Therefore, the Examiner further contends that it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the polisher of

Breivogel to polish the low k workpiece of Towery since both inventions deal with polishing semiconductor workpieces with platens configured to orbit with dielectric materials, and since the Towery reference teaches polishing the low k workpiece using chemical mechanical polishing. The Examiner further asserts that it would have been obvious to provide the polishing system of Breivogel with the carrier configured to apply about 0.2 to about 2 pounds per square inch pressure to the workpiece in the platen being configured to allow the polishing slurry to flow at a rate of about 120 to 200 ml/m since the Breivogel reference teaches that one may change the parameters in order to optimize the polishing process for a specific application.

Applicants respectfully traverse this rejection.

Contrary to the Examiner's assertions, Towery fails to disclose CMP of a low k dielectric material with a platen configured to orbit and polish with a surface speed of about 0.8 to 3.2 m/s. Instead, Towery discloses CMP "performed for two (2) minutes at a polishing pressure of 23 x  $10^3$  Pa (approximately 3.3 pounds per square inch (psi)) and a linear velocity of 0.48 meters per second (m/s)." (See Column 7, Lines 64-67). Breivogel also fails to teach polishing with a surface speed of about 0.8 to 3.2 m/s.

In addition, Breivogel fails to teach Applicants' amended independent claim 1 which requires a platen configured to orbit about an axis at a speed within a range of about 500 to about 2000 revolutions per minute. Instead, Breivogel teaches that "it has been found that an orbit rate of between 140-220 orbits/min provides good polish uniformity and wafer throughput" (see Column 5, Lines 28-32). Towery also fails to disclose a platen configured to orbit about an axis at a speed within a range of about 500 to about 2000 revolutions per minute. Accordingly, in that neither Breivogel nor Towery teaches the elements of Applicants' claimed invention which

include a platen configured to orbit about an axis at a speed within a range of about 500 to about 2000 revolutions per minute and a platen configured to move the workpiece relative to the polishing surface at a speed of about 0.8 to 3.2 m/s, it could not be obvious to one of ordinary skill in the art to arrive at Applicants' claimed invention.

Claim 10 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Breivogel as modified by Towery as applied to claims 1-9, 26-29, 32 and 33 above, and further in view of Chen, U.S. Patent No. 6,241, 593 B1 (hereafter "Chen"). In particular, the Examiner states that Breivogel as modified by Towery teaches all the limitations of the claims except for the carrier head including a bladder to regulate the pressure applied to the workpiece. The Examiner then contends that Chen teaches a bladder, 144. Accordingly, the Examiner asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the carrier head of Breivogel as modified by Towery with a bladder as taught by Chen in order to more efficiently regulate the pressure applied to the workpiece. Applicants respectfully traverse this rejection.

As previously stated above, neither Breivogel nor Towery disclose a platen configured to orbit about an axis at a speed within a range of about 500 to about 2000 revolutions per minute as required by Applicants' claim 10. In addition, Chen fails to disclose this same element. Accordingly, it could not be obvious to one of ordinary skill in the art to combine Breivogel, Towery, and Chen to arrive at Applicants' claimed invention.

Claims 11, 30 and 31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Breivogel as modified by Towery as applied to claims 1-9, 26-29, 32 and 33 above, and further in view of Kawamoto et al., U.S. Patent No. 6,416,284 B1 (hereafter "Kawamoto"). In

particular, the Examiner states that Breivogel as modified by Towery teaches all of the limitations of the claims except for the platen including a conduit configured to allow heat exchange fluid to flow through to thereby regulate the temperature of the polishing surface and the polishing fluid. The Examiner then asserts that Kawamoto teaches a conduit configured to allow heat exchange fluid to flow through and that it would therefore have been obvious to one having ordinary skill in the art at the time the invention was made to provide the polisher of Breivogel as modified by Towery with a conduit to allow heat exchange as taught by Kawamoto in order to enhance the temperature control of the polishing system. Applicants respectfully traverse this rejection.

As previously stated above, neither Breivogel nor Towery disclose a platen configured to orbit an axis at a speed above 500 revolutions per minute. In addition, Kawamoto fails to disclose this element as well. Therefore, it could not have been obvious to one having ordinary skill in the art at the time the invention was made to combine Breivogel, Towery and Kawamoto to arrive at Applicants' claimed invention.

Claims 12, 13, 17-20, 22, 24 and 25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Breivogel as modified by Towery as applied to claims 1-9, 26-29, 32 and 33 above, and further in view of Aizawa et al., U.S. Patent No. 6,036,582 (hereafter "Aizawa"). More specifically, the Examiner states that Breivogel as modified by Towery teaches all of the limitations of the claims except for the polishing system comprising a plurality of polishing stations, clean stations, a load station, and a buff station. The Examiner then states that Aizawa teaches a plurality of polishing stations, clean stations, a load station, and a buff station in addition to teaching an orbital platen. The Examiner therefore contends that it would have been

obvious to one having ordinary skill in the art to provide the polishing system of Breivogel as modified by Towery with a plurality of polishing stations, a clean station, a load station, and a buff station as taught by Aizawa in order to more efficiently and rapidly perform the polishing operations, and since both inventions deal with CMP utilizing a carrier and an orbital platen. Applicants respectfully traverse this rejection.

Each of Applicants claims 12, 13, 17-20, 22, 24 and 25 require a platen configured to move relative to a workpiece comprising low-k material at about 0.8 to about 3.2 m/s. As previously stated above, neither Breivogel nor Towery disclose this claimed element. In addition, Aizawa further fails to disclose this claimed element. Accordingly, it could not be obvious to one of ordinary skill in the art to arrive at Applicants' claims by combining Breivogel, Towery and Aizawa.

Claims 14-16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Breivogel as modified by Towery and Aizawa and further in view of Chen. In particular, the Examiner states the Breivogel as modified by Towery and Aizawa teaches all of the limitations of the claims except for the system further comprising a carousel carrier apparatus, configured to rotate about an axis and translate in a radial direction. The Examiner then states that Chen teaches a carousel carrier apparatus configured to rotate about an axis and translate in a radial direction. Therefore, the Examiner contends that it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the polishing system of Breivogel as modified by Towery and Aizawa with the carousel carrier in order to enhance the polishing efficiency. Applicants respectfully traverse this rejection.

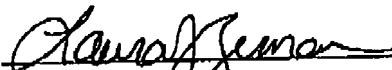
Each of Applicants' claims 14-16 require a platen configured to move at about 0.8 to about 3.2 m/s relative to a wafer comprising low-k material. As previously stated above, neither Breivogel, Towery, nor Aizawa teaches this limitation. In addition, Chen also fails to teach this limitation. Therefore, it could not have been obvious to one having ordinary skill in the art at the time the invention was made to combine these references to arrive at Applicants' claims.

Claims 21 and 23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Breivogel as modified by Towery and Aizawa, and further in view of Kawamoto. In particular, the Examiner states that Breivogel as modified by Towery and Aizawa teaches all of the limitations of the claims except for the polishing system comprising a temperature control system in a form grooves in the platen to allow heat exchange fluid to flow through a portion of the platen. The Examiner then states that Kawamoto teaches grooves in the platen to allow heat exchange fluid to flow through a portion of the platen. Accordingly, the Examiner contends that it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the polishing system of Breivogel as modified by Towery and Aizawa with a conduit to allow heat exchange, as taught by Kawamoto, in order to enhance the temperature control of the polishing system. Applicants respectfully traverse this rejection.

Applicants' claims 21 and 23 each require a platen configured to move at about 0.8 to about 3.2 m/s relative to the wafer comprising low-k material. As previously discussed above, neither Breivogel, Towery, Aizawa, nor Kawamoto, either alone or in combination, disclose this claimed element. Accordingly, it could not have been obvious to one of ordinary skill in the art to combine these references to arrive at Applicants' claims.

In view of the foregoing, Applicant respectfully submits that all of the pending claims fully comply with 35 U.S.C. §112 and are allowable over the prior art of record. Reconsideration of the application and allowance of all pending claims is earnestly solicited. Should the Examiner wish to discuss any of the above in greater detail or deem that further amendments should be made to improve the form of the claims, then the Examiner is invited to telephone the undersigned at the Examiner's convenience. Applicants authorize and respectfully request that any fees due be charged to Deposit Account No. 19-2814. This statement does NOT authorize charge of the issue fee.

Respectfully submitted,

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